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10/585,446

07/07/2006

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EXAMINER

LE, HOA T

ART UNIT

PAPER NUMBER

1787

NOTIFICATION DATE

DELIVERY MODE

08/05/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/585,446 | Applicant(s) TSUZUKI ET AL. | |
| | Examiner H. (Holly) T. Le | Art Unit 1787 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 21-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>7/7/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-20 in the reply filed on May 20, 2010 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2 and 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, the phrase "the maximum particle size is 63 or less" is meaningless. A maximum point can have only one value. In addition, "mode size" as recited is unclear as it is incomplete.

Claim 3 suffers the same deficiency of claim 2 with regard to the term "mode size".

Claim Rejections - 35 USC § 102/103

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1787

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 11, and 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 56-000,834 ("JP'834").

Claims 1 and 11: JP'834 teaches inorganic powder, in particular alumina powder, having a bimodal particle size distribution: from 0.8 to 2.5 μm , 4 to 18 μm and 25 to 40 μm . Therefore, the powder necessarily exhibits at least two peaks, one in the 0.8 to 2 μm and at least one in the 4 to 40 μm regions, which are within the claimed two peak regions. See abstract and table 1.

Claims 16-17: The alumina does not contain any sulfur or chlorine; therefore, the content of sulfate ion or chlorine ion is necessarily substantially zero.

Claim 18: The alumina does not contain any iron; therefore, the content of iron oxide is necessarily substantially zero.

Claim 19: The smallest particle size is 0.8 μm which is 800 nm; therefore, the alumina contains no particles less than 50 nm.

Art Unit: 1787

7. Claims 1-6, 11, and 16-19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,284,829 ("US'829").*

US'829 teaches inorganic powder having a bimodal particle size distribution in the range of 0.1 to 5 μm and 15 to 35 μm . See US'829, col. 2, lines 60-65. More particularly, US'829 teaches smaller-sized powder having a bimodal particle size distribution with a first domain in the order of 2 μm and a second domain in the order of 0.2 μm (col. 3, lines 9-15). Therefore, the inorganic powder taught by US'829 necessarily has at least two peaks within the claimed ranges of 0.2 to 2 μm and 2 to 63 μm .

Claim 2: the maximum particle size is 40 μm (col. 2, lines 60-62).

Claims 3-6: US'829 teaches that the distribution of the large-sized particles is 85 to 95% and the smaller-sized particles is 5 to 15% (col. 3, lines 15-19). This range overlaps the claimed range with sufficient specificity given the substantial overlap of the entire range disclosed by US'829 and that of the claim. Alternatively, because the ranges disclosed by US'829 overlap with the claimed ranges, the ranges as described in claims 3-6 are considered obvious. In addition, selection of various particle size ranges would have been obvious as matter of choice.

Claim 11: the powder comprises alumina (col. 3, lines 20-21).

Claims 16-17: Alumina powder contains no sulfur or chlorine; therefore, the sulfate ion or chlorine ion in the powder is substantially zero.

* cited by Applicant.

Art Unit: 1787

Claim 18: The alumina does not contain any iron; therefore, the content of iron oxide is necessarily substantially zero.

Claim 19: Both smaller-sized particles and larger-sized particles start at 0.1 microns (col. 2, lines 60-65 and col. 3, lines 9-15); therefore, the smallest particle size is 100 nm.

8. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admission of simple manipulation of commercially available products. As shown in Examples 1-8 of the instant specification, the alumina powder having the specific bimodal particle size distribution is simply a result of mixing commercially available alumina powders of two or more different particle sizes. Simple mixing of commercially available inorganic powders is not inventive because it requires nothing more than the basic knowledge of one of ordinary skill in the art. Particles of bimodal or multimodal particle size distribution are preferred for packing efficiency as the smaller particles would fill in the gaps between the larger particles. Therefore, selection of particles having the peaks within the regions as claimed would have been obvious. Spherical particles are favored over non-spherical for dispersibility and flowability. Additionally, the spheroidicity and spheroidization ratio and the crystal fraction as claimed are the intrinsic properties of the commercially available alumina powders. See instant specification, Table 1. Hydrophobizing inorganic metal oxide powder, in particular alumina powder, with a silane-coupling agent is commonly done in the art. See for example, US 5,379,753; US 7,081,234 or US 7,323,280.

9. Claims 2-10, 12-15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 56-000,834 ("JP'834") as applied to claims 1, 11, and 16-19 , above, and further in view of the discussion below.

Particles of bimodal or multimodal particle size distribution are preferred for packing efficiency as the smaller particles would fill in the gaps between the larger particles. Therefore, selection of particles having the peaks within the regions as claimed would have been obvious. Spherical particles are favored over non-spherical for dispersibility and flowability. Additionally, the spheroidicity and spheroidization ratio and the crystal fraction as claimed are the intrinsic properties associated with the alumina powders having the bimodal particle size distribution as taught in JP'834. See instant specification, Table 1. Therefore, a selection of particles having bimodal particle size distribution as taught by JP'834 would result in the properties as claimed.

Hydrophobizing inorganic metal oxide powder, in particular alumina powder, with a silane-coupling agent is commonly done in the art. See for example, US 5,379,753; US 7,081,234 or US 7,323,280.

10. Claims 7-10, 12-15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,284,829 ("US'829") as applied to claims 1-6, 11, and 16-19 above, and further in view of the discussion below.

Particles of bimodal or multimodal particle size distribution are preferred for packing efficiency as the smaller particles would fill in the gaps between the larger particles. Therefore, selection of particles having the peaks within the regions as

Art Unit: 1787

claimed would have been obvious. Spherical particles are favored over non-spherical for dispersibility and flowability. Additionally, the spheroidicity, spheroidization ratio, crystal fraction and thermal conductivity as claimed are the intrinsic properties associated with the alumina powders having the bimodal particle size distribution as taught in US'829. See instant specification, Table 1. Therefore, a mix of particles of different particle sizes as taught by US'829 would result in the properties as claimed. Hydrophobizing inorganic metal oxide powder, in particular alumina powder, with a silane-coupling agent is commonly done in the art. See for example, US 5,379,753; US 7,081,234 or US 7,323,280.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. (Holly) T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 12:30 p.m. to 9:00 p.m. (EST), Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1787

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. (Holly) T. Le/
Primary Examiner, Art Unit 1787

July 30, 2010